



Express Mail No. EV 373446199 US

Deposited on: 11/30/2004

PTO/SB/21 (08-00)  
Approved for use through 10/31/2002. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

Application Number	10/814,752
Filing Date	03/31/2004
First Named Inventor	Paul L. DeAngelis
Group Art Unit	1653
Examiner Name	Not Yet Assigned
Attorney Docket Number	4599.014

Total Number of Pages in This Submission

**ENCLOSURES (check all that apply)**

- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Fee Transmittal Form<br><input type="checkbox"/> Fee Attached<br><input type="checkbox"/> Amendment / Reply<br><input type="checkbox"/> After Final<br><input type="checkbox"/> Affidavits/declaration(s)<br><input type="checkbox"/> Extension of Time Request<br><input type="checkbox"/> Express Abandonment Request<br><input checked="" type="checkbox"/> Information Disclosure Statement<br><input type="checkbox"/> Certified Copy of Priority Document(s)<br><input type="checkbox"/> Response to Missing Parts/ Incomplete Application<br><input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53 | <input type="checkbox"/> Assignment Papers (for an Application)<br><input type="checkbox"/> Drawing(s)<br><input type="checkbox"/> Licensing-related Papers<br><input type="checkbox"/> Petition<br><input type="checkbox"/> Petition to Convert to a Provisional Application<br><input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address<br><input type="checkbox"/> Terminal Disclaimer<br><input type="checkbox"/> Request for Refund<br><input type="checkbox"/> CD, Number of CD(s) _____ | <input type="checkbox"/> After Allowance Communication to Group<br><input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences<br><input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)<br><input type="checkbox"/> Proprietary Information<br><input type="checkbox"/> Status Letter<br><input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):<br>See remarks below: |
|--|---|---|
- Remarks  
1. Transmittal Form (1 page);  
2. Fee Transmittal (1 page);  
3. Information Disclosure Statement (3 pages);  
4. Information Disclosure Statement by Applicant (formerly Form 1449) (7 pages);  
5. Cited Material; and  
6. Postcard.

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm or Individual name	DUNLAP, CODDING & ROGERS, P.C., Customer Number 30589 Attn.: Kathryn L. Hester, Ph.D., P. O. Box 16370, Oklahoma City, Oklahoma 73113
Signature	
Date	11-30-04

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail or U.S. Express mail no. EV 373446199 US in an envelope addressed to the address below on this date: 11/30/2004

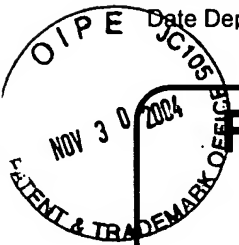
Typed or printed name	Kathryn L. Hester, Ph.D., Reg. No. 46,768
Signature	
Date	11-30-04

SEND TO: Mail Stop - IDS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Express Mail No.: EV 373446199 US

Date Deposited: 11/30/2004

PTO/SB/17 (10-04)

Approved for use through 07/31/2006. OMB 0651-0032  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

# FEE TRANSMITTAL for FY 2005

Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ ) 0

## Complete if Known

Application Number	10/814.752
Filing Date	03/31/2004
First Named Inventor	Paul DeAngelis
Examiner Name	Not Yet Assigned
Art Unit	1653
Attorney Docket No.	4599.014

## METHOD OF PAYMENT (check all that apply)

☐ Check ☒ Credit card ☐ Money Order ☐ Other ☐ None☐ Deposit Account:Deposit Account Number  
Deposit Account Name

The Commissioner is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments☒ Charge any additional fee(s) during the pendency of this application☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

## 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	790	2001	395	Utility filing fee	
1002	350	2002	175	Design filing fee	
1003	550	2003	275	Plant filing fee	
1004	790	2004	395	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) (\$ ) 0

## 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims		Fee from below		Fee Paid	
Total Claims		** =	0	X		=	\$0
Independent Claims		** =	0	X		=	\$0
Multiple Dependent						=	\$0

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	88	2201	44	Independent claims in excess of 3
1203	300	2203	150	Multiple dependent claim, if not paid
1204	88	2204	44	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ ) 0

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

## 3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	430	2252	215	Extension for reply within second month	
1253	980	2253	490	Extension for reply within third month	
1254	1,530	2254	765	Extension for reply within fourth month	
1255	2,080	2255	1,040	Extension for reply within fifth month	
1401	340	2401	170	Notice of Appeal	
1402	340	2402	170	Filing a brief in support of an appeal	
1403	300	2403	150	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,370	2453	685	Petition to revive - unintentional	
1501	1,370	2501	685	Utility issue fee (or reissue)	
1502	490	2502	245	Design issue fee	
1503	660	2503	330	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ ) 0

## SUBMITTED BY

(Complete if applicable)

Name (Print/Type)	Kathryn L. Hester, Ph.D.	Registration No. (Attorney/Agent)	46,768	Telephone	(405) 607-8600
Signature		Date	11/30/2004		

Mail Stop - IDS  
Commissioner for Patents  
PO Box 1450, Alexandria, VA 22313-1450

**EXPRESS MAIL NO.: EV 373446199 US**  
**DATE DEPOSITED: NOVEMBER 30, 2004**

**PATENT**



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Paul DeAngelis ) Atty. Dkt. No. 4599.014  
Serial No.: 10/814,752 )  
Filed: March 31, 2004 )

For: HEPARIN/HEPAROSAN SYNTHASE FROM P. MULTOCIDA, SOLUBLE AND  
SINGLE ACTION CATALYSTS THEREOF AND METHODS OF MAKING AND  
USING SAME

Mail Stop - IDS  
Commissioner for Patents  
P.O. Box 1450, Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

**List Of Sections Forming Part Of This  
Information Disclosure Statement**

The following sections are being submitted for this Information Disclosure  
Statement:

1. ☒ Preliminary Statements
2. ☒ Form PTO/SB/08A And 08B (formerly Form PTO-1449)
3. ☒ Copies Of Listed Information Items Accompanying This  
Statement
4. ☒ Identification Of Person(s) Making This Information  
Disclosure Statement

## **Section 1. Preliminary Statements**

Applicants submit herewith patents, publications or other information of which they are aware, which they believe may be material to the examination of this application and in respect of which there may be a duty to disclose.

The filing of this information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability or that no other material information exists.

The filing of this information disclosure statement shall not be construed as an admission against interest in any manner. Notice of January 9, 1992, 1135 O.G. 13-25, at 25.

## **Section 2. Form PTO/SB/08A And 08B (Modified)**

☒ [X] A completed Form PTO/SB/08A and/or 08B is attached hereto.

☐ [ ] No Form PTO/SB/08A and/or 08B is attached.

## **Section 4. Copies Of Listed Information Items Accompanying This Statement**

Legible copies of all items listed in Form PTO/SB/08A And 08B (Modified) accompany this information disclosure statement.

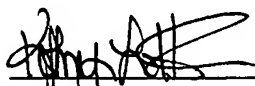
☒ [X] As this application is being filed after June 30, 2003, no copies of cited U.S. patents or patent application publications are submitted herewith.

**Section 5. Identification Of Person(s) Making This Information Disclosure Statement**

The person making this statement is the attorney/agent who signs below on the basis of the information:

- ☐ supplied by the inventor(s)
- ☐ supplied by an individual associated with the filing and prosecution of this application (37 C.F.R. § 1.56(c)).
- ☒ in the attorney/agent's file

Respectfully submitted,



---

Kathryn L. Hester, Ph.D.  
Reg. No. 46,768  
DUNLAP, CODDING & ROGERS, P.C.  
P.O. Box 16370  
Oklahoma City, Oklahoma 73118  
Telephone - (405) 607-8600  
Facsimile - (405) 607-8686

Agent for Applicant

PTO/SB/08A (08-00)  
Approved for use through 10/31/2002. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE



Substitute for form 1449A/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>			<b>Complete if Known</b>		
			Application Number	10/814,752	
			Filing Date	03/31/2004	
			First Named Inventor	Paul DeAngelis	
			Group Art Unit	1653	
			Examiner Name	Not Yet Assigned	
Sheet	1	of	7	Attorney Docket Number	4599.014

[illegible][illegible]

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

<sup>1</sup> Unique citation designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

**SEND TO:** Mail Stop - IDS  
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313

Express Mail: EV 373446199 US  
Date Deposited: 11/30/2004

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449B/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		<b>Complete if Known</b>	
		Application Number	10/814,752
		Filing Date	03/31/2004
		First Named Inventor	Paul DeAngelis
		Group Art Unit	1653
		Examiner Name	Not Yet Assigned
Sheet 2	of 7	Attorney Docket Number	4599.014

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	AA	VANN, W.F., et al.: The Structure of the Capsular Polysaccharide (K5 Antigen) of Urinary-Tract-Infective Escherichia coli 010:K5:H4. Biochem J. 116:359-364 (1981).	
	AB	FAREED, J.: Heparin, Its Fractions, Fragments and Derivatives. Some Newer Perspectives. Seminars in Thrombosis and Hemostasis. 11(1):1-9 (1985).	
	AC	ROBERTS, I., et al.: Molecular Cloning and Analysis of Genes for Production of K5, K7, K12, and K92 Capsular Polysaccharides in Escherichia coli. J. Bacteriology. 168(3):1228-1233 (1986).	
	AD	ROBERTS, I.S., et al.: Common Organization of Gene Clusters for Production of Different Capsular Polysaccharides (K Antigens) in Escherichia coli. J. Bacteriology. 170(3):1305-1310 (1988).	
	AE	KRONCKE, K.D., et al.: Expression of the Escherichia coli K5 Capsular Antigen: Immunoelectron Microscopic and Biochemical Studies with Recombinant E. coli. J. Bacteriology. 172(2):1085-1091 (1990).	
	AF	SMITH, A.N., et al.: Molecular analysis of the Escherichia coli K5 kps locus: identification and characterization of an inner-membrane capsular polysaccharide transport system. Molecular Microbiology. 4(11):1863-1869 (1990).	
	AG	KUSCHE, M., et al.: Biosynthesis of heparin. Use of Escherichia coli K5 capsular polysaccharide as a model substrate in enzymic polymer-modification reactions. Biochem J. 275(pt1):151-8 (1991).	
	AH	SOLDANI, G., et al.: Experimental and Clinical Pharmacology of Glycosaminoglycans (GAGs). Drugs Exptl. Clin. Res. XVII(1):81-85 (1991).	
	AI	LIDHOLT, K., et al.: Biosynthesis of heparin. The D-glucuronosyl- and N-acetyl-D-glucosaminyltransferase reactions and their relation to polymer modification. Biochem J. 287(pt 1):21-9 (1992).	
	AJ	BRONNER, D., et al.: Synthesis of the K5 (group II) capsular polysaccharide in transport-deficient recombinant Escherichia coli. FEMS Microbiology Letters 113:279-284 (1993).	
	AL	LIND, T., et al.: Biosynthesis of Heparin/Heparan Sulfate. The Journal of Biological Chemistry. 268(28):20705-20708 (1993).	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Express Mail: EV 373446199 US  
Date Deposited: 11/30/2004

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449B/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		<b>Complete if Known</b>			
		Application Number	10/814,752		
		Filing Date	03/31/2004		
		First Named Inventor	Paul DeAngelis		
		Group Art Unit	1653		
		Examiner Name	Not Yet Assigned		
Sheet	3	of	7	Attorney Docket Number	4599.014

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	AM	PANDIT, K.K., et al.: Capsular hyaluronic acid in Pasteurella multocida type A and its counterpart in type D. Research in Veterinary Science. 54:20-24 (1993).	
	AN	CASU, B., et al.: Heparin-like compounds prepared by chemical modification of capsular polysaccharide from E. coli. Elsevier Science. 263:271-284 (1994).	
	AO	LIDHOLT, K., et al.: Substrate specificities of glycosyltransferases involved in formation of heparin precursor and E. Coli K5 capsular polysaccharides. Carbohydrate Research. 255:87-101 (1994).	
	AP	RIMLER, R.B.: Presumptive Identification of Pasteurella multocida serogroups A, D and F by capsule depolymerisation with mucopolysaccharidases. Veterinary Record.134:191-192 (1994).	
	AC	AHN, J., et al.: Cloning of the putative tumor suppressor gene for hereditary multiple exostoses (EXT1). Nat. Genet. 11(2):137-43 (1995).	
	AR	PETIT, C., et al.: Region 2 of the Escherichia coli K5 capsule gene cluster encoding proteins for the biosynthesis of the K5 polysaccharide. Molecular Microbiology. 17(4):611-620 (1995).	
	AS	RAZI, N., et al.: Structural and functional properties of heparin analogues obtained by chemical sulphation of Escherichia coli K5 capsular polysaccharide. Biochem J. 309 (pt2):465-72 (1995).	
	AT	RIMLER, R.B., et al.: Influence of chondroitinase on direct hemagglutination titers and phagocytosis of Pasteurella multocida serogroups A, D and F. Veterinary Microbiology. 47:287-294 (1995).	
	AU	STICKENS, D., et al.: The EXT2 multiple exostoses gene defines a family of putative tumor suppressor genes. Nat. Genet. 14(1):25-32 (1996).	
	AV	CLINES, G.A., et al.: The Structure of the Human Multiple Exostoses 2 Gene and Characterization of Homologs in Mouse and Caenorhabditis elegans. Cold Spring Harbor Laboratory Press. 7:359-367 (1997).	
	AW	WISE, C.A., et al.: Identification and Localization of the Gene for EXTL, a Third Member of the Multiple Exostoses Gene Family. Cold Spring Harbor Laboratory Press. 7:10-16 (1997).	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.



Express Mail: EV 373446199 US  
Date Deposited: 11/30/2004

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031  
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449B/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		<b>Complete if Known</b>	
		Application Number	10/814,752
		Filing Date	03/31/2004
		First Named Inventor	Paul DeAngelis
		Group Art Unit	1653
		Examiner Name	Not Yet Assigned
Sheet 4	of 7	Attorney Docket Number	4599.014

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	AX	WYATT TECHNOLOGY CORPORATION: Heparin Characterization. 4/5; www.tigc.org.	
	AY	GRIFFITHS, G., et al.: Characterization of the Glycosyltransferase Enzyme from the Escherichia coli K5 Capsule Gene Cluster and Identification and Characterization of the Glucuronyl Active Site. The Journal of Biological Chemistry, 273(19):11752-11757 (1998).	
	AZ	LIN, X, et al.: Expression and functional analysis of mouse EXT1, a homolog exostosins type 1 gene. Biochem Biophys Res Commun.; 248(3):738-43 (1998).	
	BA	LIND, T., et al.: The Putative Tumor Suppressors EXT1 and EXT2 Are Glycosyltransferases Required for the Biosynthesis of Heparan Sulfate. The Journal of Biological Chemistry, 273(41):26265-26268 (1998).	
	BB	McCORMICK, C., et al.: The putative tumor suppressor EXT1 alters the expression of cell-surface heparan sulfate. Nat. Genet. 19(2):158-61 (1998).	
	BC	RIGG, G.P., et al.: The localization of KpsC, S and T, and KfiA, C and D Proteins Involved in the biosynthesis of the Escherichia coli K5 capsular polysaccharide: evidence for a membrane-bound complex. Microbiology 144, 2905-2914 (1998).	
	BD	VAN HUL, W., et al.: Identification of a Third EXT-like Gene (EXTL3) Belonging to the EXT Gene Family. Genomics. 47(2):230-7 (1998).	
	BE	FINKE, A., et al.: Biosynthesis of the Escherichia coli K5 Polysaccharide, a Representative of Group II Polysaccharides: Polymerization In Vitro and Characterization of the Product. Journal of Bacteriology. 4088-4094 (1999).	
	BF	KITAGAWA, H., et al.: The Tumor Suppressor EXT-like Gene EXTL2 Encodes an 1, 4-N-Acetylhexosaminyltransferase That Transfers N-Acetylgalactosamine and N-Acetylglucosamine to the Common Glycosaminoglycan-Protein Linkage Region. The Journal of Biological Chemistry. 273(20):13933- <input checked="" type="checkbox"/>	
	BG	LINHARDT, R.J., et al.: Production and Chemical Processing of Low Molecular Weight Heparins. Thieme Medical Publishers, Inc. 25(3):5-16 (1999).	
	BH	NADER, H.B., et al.: New insights on the specificity of heparin and heparan sulfate lyases from Flavobacterium heparinum revealed by the use of synthetic derivatives of K5 polysaccharide from E. coli and 2-O-desulfated heparin. Glycoconj J. 16(6):265-70 (1999).	

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Express Mail: EV 373446199 US  
Date Deposited: 11/30/2004

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449B/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		<b>Complete if Known</b>			
		<b>Application Number</b>	10/814,752		
		<b>Filing Date</b>	03/31/2004		
		<b>First Named Inventor</b>	Paul DeAngelis		
		<b>Group Art Unit</b>	1653		
		<b>Examiner Name</b>	Not Yet Assigned		
<b>Sheet</b>	5	<b>of</b>	7	<b>Attorney Docket Number</b>	4599.014

<b>OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS</b>			
<b>Examiner Initials*</b>	<b>Cite No.<sup>1</sup></b>	<b>Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.</b>	<b>T<sup>2</sup></b>
	BI	SIMMONS, A.D., et al.: A director interaction between EXT proteins and glycosyltransferases is defective in hereditary multiple exostoses. Hum. Mol. Genet. ; 8(12):2155-64 (1999).	
	BJ	SONG, G., et al.: Identification of mutations in the human EXT1 and EXT2 genes. Chin J. Med. Genet., 16(4):208-10 (1999).	
	BK	BOYCE, J.D., et al.: Pasteurella multocida capsule: composition, function and genetics. Journal of Biotechnology 83:153-160 (2000).	
	BL	HAGNER-McWHIRTER A., et al.: Biosynthesis of heparin/heparan sulfate: kinetic studies of the glucuronyl C5-epimerase with N-sulfated derivatives of the Escherichia coli K5 capsular polysaccharide as substrates. Glycobiology. 10(2):159-71 (2000).	
	BN	HODSON, N., et al.: Identification That KfiA, a Protein Essential for the Biosynthesis of the Escherichia coli K5 Capsular Polysaccharide, Is a UDP-GlcNAc Glycosyltransferase. The Journal of Biological Chemistry, 275(35):27311-27315 (2000).	
	BN	LEGEAI-MALLET L., et al.: EXT 1 Gene Mutation Induces Chondrocyte Cytoskeletal Abnormalities and Defective Collagen Expression in the Exostoses. J Bone Miner Res. 15(8):1489-500 (2000).	
	BO	LIN, X, et al.: Disruption of gastrulation and heparan sulfate biosynthesis in EXT1-Deficient Mice. Dev. Biol. 224(2):299-311 (2000).	
	BP	McCORMICK, C., et al.: The putative tumor suppressors EXT1 And EXT2 form a stable complex that accumulates in the Golgi apparatus and catalyzes the synthesis of heparan sulfate. PNAS, 97(2):668-673 (2000).	
	BQ	PEDERSEN, L.C., et al.: Heparan/Chondroitin Sulfate Biosynthesis. The Journal of Biological Chemistry, 275(44):34580-34585 (2000).	
	BR	SASISEKHARAN, R., et al.: Heparin and heparan sulfate: biosynthesis, structure and function. Elsevier Science, Ltd. 1367-5931:626-631 (2000).	
	BS	SENAY, C., et al.: The EXT1/EXT2 tumor suppressors: catalytic activities and role in heparan sulfate biosynthesis. EMBO Reports 1(3):282-286 (2000).	

<b>Examiner Signature</b>		<b>Date Considered</b>	
-------------------------------	--	----------------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Express Mail: EV 373446199 US  
Date Deposited: 11/30/2004

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449B/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		<b>Complete if Known</b>	
		Application Number	10/814,752
		Filing Date	03/31/2004
		First Named Inventor	Paul DeAngelis
		Group Art Unit	1653
		Examiner Name	Not Yet Assigned
Sheet 6	of 7	Attorney Docket Number	4599

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	BT	TOYODA, H., et al.: Structural Analysis of Glycosaminoglycans in Drosophila and Caenorhabditis elegans and Demonstrations That tout-velu, a Drosophila Gene Related to EXT Tumor Suppressors, Affects Heparan Sulfate in Vivo. The Journal of Biological Chemistry, 275( 4):2269-2275 (2000).	
	BU	WEI, G., et al.: Location of the Glucuronosyltransferase Domain in the Heparan Sulfate Copolymerase EXT1 by Analysis of Chinese Hamster Ovary Cell Mutants. The Journal of Biological Chemistry, 275(36):27733-27740 (2000).	
	BV	BIO TIE THERAPIES; BioHeparin - Prospectus; June 2001. (Finland)	
	BW	CHEUNG, P.K., et al.: Etiological Point Mutations in the Hereditary Multiple Exostoses Gene EXT1: A Functional Analysis of Heparan Sulfate Polymerase Activity. Am. J. Hum. Genet. 69:55-66, (2001).	
	BX	DUNCAN, G., et al.: The link between heparan sulfate and hereditary bone disease: finding a function for the EXT family of putative tumor suppressor proteins. The Journal of Clinical Investigation, 108(4):511-516 (2001).	
	BY	KIM, B.T., et al.: Human tumor suppressor EXT gene family members EXTL1 and EXTL3 encode alpha 1,4-N-acetylglucosaminyltransferases that likely are involved in heparan sulfate/heparin biosynthesis. Proc. Natl. Acad. Sci. U.S.A. 1998(13):7176-81 (2001).	
	BZ	KITAGAWA, H., et al.: rib-2, a Caenorhabditis elegans Homolog of the Human Tumor Suppressor EXT Genes Encodes a Novel 1,4-N-Acetylglucosaminyltransferase Involved in the Biosynthetic Initiation and Elongation of Heparan Sulfate. The Journal of Biological Chemistry, 276(7):4834-4838 (2001).	
	CA	LEALI, D., et al.: Fibroblast Growth Factor-2 Antagonist Activity and Angiostatic Capacity of Sulfated Escherichia coli K5 Polysaccharide Derivatives. The Journal of Biological Chemistry, 276(41):37900-37908 (2001).	
	CB	MAY, B.J. et al. Complete genomic sequence of Pasteurella multocida, Pm70. Proc. Natl. Acad. Sci. 98(6):3460-3465 (2001).	
	CC	NAGGI, A., et al.: Toward a Biotechnological Heparin through Combined Chemical and Enzymatic Modification of the Escherichia coli K5 Polysaccharide. Seminars in Thrombosis and Hemostasis, 27(5):437-443 (2001).	
	CD	TOWNSEND, K.M. et al. Genetic organization of Pasteurella multocida cap loci and development of a multiplex capsular typing system. J. Clin. Microbiol. 39(3):924-929 (2001).	

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Express Mail: EV 373446199 US  
Date Deposited: 11/30/2004

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449B/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		<b>Complete if Known</b>			
		Application Number	10/814,752		
		Filing Date	03/31/2004		
		First Named Inventor	Paul DeAngelis		
		Group Art Unit	1653		
		Examiner Name	Not Yet Assigned		
Sheet	7	of	7	Attorney Docket Number	4599.014

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials <sup>*</sup>	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	CE	VAN AKEN, H., et al.: Anticoagulation: The Present and Future. Clin. Appl. Thrombosis/Hemostasis, 7(3):195-204, (2001).	
	CF	DeANGELIS, P.L., et al.: Identification of the capsular polysaccharides of Type D and F Pasteurella multocida as unmodified heparin and chondroitin, respectively. Carbohydrate Research 337:1547-1552 (2002).	
	CG	DeANGELIS, P.L., et al.: Identification and Molecular Cloning of a Heparosan Synthase from Pasteurella multocida Type D. The Journal of Biological Chemistry. 277(9):7209-7213 (2002).	
	CH	HILL, A.L., et al.: Identification of the Xenopus laevis cDNA for EXT1: A Phylogenetic Perspective. DNA Sequence, 13 (2):85-92 (2002).	
	CI	JING, W., et al.: Structure function analysis of Pasteurella glycosaminoglycan synthesis. Glycobiology 12: abstract 188.	
	CJ	KATADA, T., et al.: cDNA cloning and distribution of XEXT1, the Xenopus homologue of EXT1. Dev Genese Evol. 212:248-250 (2002).	
	CK	KIM, B-T, et al.: Demonstration of a Novel Gene DEXT3 of Drosophila melanogaster as the Essential N-Acetylglucosamine Transferase in the Heparan Sulfate Biosynthesis. The Journal of Biological Chemistry, 277(16):13659-13665 (2002).	
	CL	POGGI A., et al.: Inhibition of B16-BL6 melanoma lung colonies by semisynthetic sulfaminoheparosan sulfates from E. Coli K5 polysaccharide. Semin Thromb Hemost. 28(4):383-92 (2002).	
	CM	SUGAHARA, K., et al.: Heparin and Heparan Sulfate Biosynthesis. Life, 54:163-175 (2002).	
	CN	ZAK, B.M., et al.: Hereditary multiple exostoses and heparan sulfate polymerization. Biochimica et Biophysica Acta 1573:346-355 (2002).	
	CO	VICENZI, E., et al.: Broad spectrum inhibition of HIV-1 infection by sulfated K5 Escherichia coli polysaccharide derivatives. AIDS. 17(2):177-81 (2003).	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.